AWARD NUMBER:

W81XWH-16-1-0321

TITLE:

Trial of Propranolol in Children and Youth with ASD and Predictors of Response.

PRINCIPAL INVESTIGATOR: David Beversdorf, MD

RECIPIENT: University of Missouri
Columbia, MO 65211

REPORT DATE: July 2017

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
July 2017	Annual	1 Jul 2016 - 30 Jun 2017

4. TITLE AND SUBTITLE

Trial of Propranolol in Children and Youth with ASD and Predictors of Response.

5a. CONTRACT NUMBER

5b. GRANT NUMBER
W81XWH-16-1-0321

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Dr. David Beversdorf

E-Mail: beversdorfd@health.missouri.edu

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
University of Missouri
Office of Sponsored Programs
115 Business Loop 70W
Mizzou North, Room 501
Columbia, MO 65211

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
Our purpose is to explore the effects of propranolol in children and youth with ASD, and also determine whether psychophysical markers of sympathetic/parasympathetic balance predict response. Our previous neuropsychopharmacological and pharmacofMRI work has demonstrated benefits with single doses in high functioning adults and adolescents. We are examining the effects of serial doses of propranolol on social interaction, and secondarily on language tasks, anxiety, adaptive behaviors, and global function in high-functioning youth (Aim 1a) as well as children (Aim 1b) with autism in a double-blinded, placebo-controlled serial dose trial. We will also explore whether response to treatment can be predicted based upon markers of increased adrenergic tone, such as GSR, HRV, and PLR, and whether anxiety or fcMRI (for the youth) predicts treatment response. The design for both aims will be a double-blinded, placebo-controlled trial, 12 weeks in duration, with psychophysical and neuroimaging (for the youth) biomarkers for prediction of response. Successful completion of this work will therefore directly result in the development of a new evidence-based treatment option for core features of ASD, which does not currently exist. It may also result in markers to predict who is most likely to respond. This could be particularly important as it would have its impact earlier in development for children and will impact the underserved older population as well. Finally, as this agent is widely available in a generic form, it will increase access of care to the underserved

15. SUBJECT TERMS
Propranolol, noradrenergic, autism spectrum disorder, psychophysiology, fMRI, social interaction, language, clinical trial

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			USAMRMC
Unclassified	Unclassified	Unclassified	Unclassified	16	19b. TELEPHONE NUMBER *(include area code)*

TABLE OF CONTENTS

1. **INTRODUCTION:** Narrative that briefly (one paragraph) describes the subject, purpose and scope of the research.

Our purpose is to explore the effects of propranolol in children and youth with ASD, and also determine whether psychophysical markers of sympathetic/parasympathetic balance predict response. Our previous neuropsychopharmacological and pharmacofMRI work has demonstrated benefits with single doses in high functioning adults and adolescents. We are examining the effects of serial doses of propranolol on social interaction, and secondarily on language tasks, anxiety, adaptive behaviors, and global function in high-functioning youth (Aim 1a) as well as children (Aim 1b) with autism in a double-blinded, placebo-controlled serial dose trial. We will also explore whether response to treatment can be predicted based upon markers of increased adrenergic tone, such as GSR, HRV, and PLR, and whether anxiety or fcMRI (for the youth) predicts treatment response. The design for both aims will be a double-blinded, placebo-controlled trial, 12 weeks in duration, with psychophysical and neuroimaging (for the youth) biomarkers for prediction of response. Successful completion of this work will therefore directly result in the development of a new evidence-based treatment option for core features of ASD, which does not currently exist. It may also result in markers to predict who is most likely to respond. This could be particularly important as it would have its impact earlier in development for children and will impact the underserved older population as well. Finally, as this agent is widely available in a generic form, it will increase access of care to the underserved.

2. **KEYWORDS:** Provide a brief list of keywords (limit to 20 words).

Propranolol, noradrenergic, autism spectrum disorder, psychophysiology, fMRI, social interaction, language, clinical trial

3. **ACCOMPLISHMENTS:** The PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency Grants Officer whenever there are significant changes in the project or its direction.

What were the major goals of the project?

List the major goals of the project as stated in the approved SOW. If the application listed milestones/target dates for important activities or phases of the project, identify these dates and show actual completion dates or the percentage of completion.

Specific Aims 1&2: (1) Preparatory phase for study and establishment of protocols for initiating the research.

Research Site

	Timeline	**University of Missouri**
Major Task 1: Preparation of regulatory aspects of project	Months	
Subtask 1: Prepare Regulatory Documents and Research Protocol for Study		
Preparation and submission of IRB protocol at University of Missouri (Investigational New Drug (IND) exemption will be part of IRB process)	1-3	DB/AGS/IGS/TCRC **COMPLETED**

Seek regulatory approval from DOD Office of Research Protection after local IRB review	2-3	DB/AGS/IGS/TCRC **COMPLETED**
Register the study through clinicaltrials.gov	1-3	DB/AGS/IGS/TCRC **COMPLETED**
Establish protocol with Investigational Drug Service	1-3	DB/AGS/IGS/TCRC **COMPLETED**
Prepare and submit protocol to Brain Imaging Center for Aim 2a	1-3	DB/IGS **COMPLETED**
Refine eligibility criteria, exclusion criteria, screening protocol	1-3	DB/AGS/IGS **COMPLETED**
Finalize consent form & human subjects protocol	1-3	DB/AGS/IGS **COMPLETED**
Submit amendments, adverse events and protocol deviations as needed	As Needed	DB/AGS/IGS **COMPLETED**
Coordinate annual IRB report for continuing review	Annually	DB/AGS/IGS **COMPLETED**
Milestone Achieved: Local IRB approval at University of Missouri, DOD Office of Research Protection Approval, registration with clinicalrials.gov	3	DB/AGS/IGS/TCRC **COMPLETED**
Milestone Achieved: Brain Imaging Center approval at University of Missouri	3	DB/IGS **COMPLETED**
Major Task 2: Preparation of materials and Coordinate Study Staff for Clinical Trials		
Subtask1: Material preparation		
Obtain and prepare all assessment materials	1-3	DB/AGS/SK/JS/MM **COMPLETED**
Prepare equipment for GSR, HRV, and PLR assessment	1-3	DB/AGS/GY **COMPLETED**
Prepare stimuli for imaging (Aim 2a)	1-3	DB/IGS/SC/JJ **COMPLETED**
Coordinate for space allocation for research team and research core staff	1-3	DB/AGS/ TCRC **COMPLETED**
Milestone Achieved: Materials prepared	4	DB/AGS/IGS **COMPLETED**
Subtask 2: Coordination with staff		
Complete and confirm training of research staff on protocol, assessments, imaging, and psychophysical measures according to established criteria for each assessment.	2-4	DB/AGS/IGS/TCRC **COMPLETED**
Milestone Achieved: Staff prepared for initiating study	4	DB/AGS/IGS/TCRC **COMPLETED**
Major Task 3: Participant Recruitment, Initiation of trail		
Subtask 1: Initiate trial		
Milestone Achieved: 1st participant consented, screened and enrolled	3-4	DB/AGS/IGS/TCRC IN PROGRESS (see below)
Milestone Achieved: Study begins	3-4	DB/AGS/IGS/TCRC

Begin subject recruitment, screening for participation for patients (inclusion/exclusion criteria)	3-40	DB/AGS/IGS/TCRC/KS IN PROGRESS (see below)
Participants enrolled into the trail for Aim 1 and Aim 2 (N=40 for each age group)	3-40	DB/AGS/IGS/TCRC IN PROGRESS (see below)
Complete follow-up assessments and monitor for adverse events	6-42	DB/AGS/IGS/TCRC/KS/PD IN PROGRESS (see below)
Milestone Achieved: Complete enrollment	40-43	DB/AGS/IGS/TCRC
Major Task 4: Preprocessing of data		
Subtask 1: Final preparation of data		
Data entry monitoring with comparison of duplicate entry for each data point	6-43	DB/AGS/TCRC
Milestone Achieved: assessment data completely entered	43	DB/AGS/TCRC
Preparation and processing of fMRI data for Aim 2a	6-43	DB/IGS/SC/JJ
Preparation and processing of PLR and other psychophysical data	6-43	DB/AGS/GY
Milestone Achieved: biomarker data collected and ready for processing	43	DB/AGS/IGS
Major Task 5: Data Analysis and preparation for presentation		
Subtask 1: Data analysis	43-46	DB/AGS/IGS/GP
Perform all analyses according to specifications, for assessments and psychophysical biomarkers	43-46	DB/AGS/GP
Perform all imaging analysis according to specifications for Aim 2a and compare to assessments and psychophysical biomarkers	43-46	DB/AGS/IGS/GP
Subtask 2: Preparation for presentation		
Work with all authors on dissemination of findings (abstracts, presentation, publications, DOD)	46-48	All investigators
Milestone Achieved: Report results from data analyses	46-48	All investigators
Preparation of subsequent proposals for application of these results	46-48	All investigators
Register results with clinicaltrials.gov	46-48	All investigators

All of the preparatory work to initiate the trial has now been completed, including approval of an amendment for collection of DNA from buccal swabs to allow for future assessment of genetic markers, as future biomarkers may arise that would be important for individualized medicine, and we would be prepared for that. We have screened 1951 participants from patients in our database that have been previously motivated to participate in research, and have identified 854 potential candidates in our initial screen for participation, and are contacting them for detailed screening, consent, and enrollment.

What was accomplished under these goals?
For this reporting period describe: 1) major activities; 2) specific objectives; 3) significant results or key outcomes, including major findings, developments, or conclusions (both positive and negative); and/or 4) other achievements. Include a discussion of stated goals not met. Description shall include pertinent data and graphs in sufficient detail to explain any significant results achieved. A succinct description of the methodology used shall be provided. As the project progresses to completion, the emphasis in reporting in this section should shift from reporting activities to reporting accomplishments.

1. IRB approved, with Investigational Drug Service approval on 25-Aug-2016
2. Brain Imaging Center approval for imaging component, and fMRI stimuli prepared. 13-Sep-2016
3. Registered on ClinicalTrials.gov, ClinicalTrials.gov identifier: NCT02871349, latest revision 03-Oct-2016
4. HRPO Approval 10-April-2017

All personnel are fully trained to prepare for the project, and all stimuli are prepared, and recruitment and enrollment are active, as described above.

What opportunities for training and professional development has the project provided?
If the project was not intended to provide training and professional development opportunities or there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe opportunities for training and professional development provided to anyone who worked on the project or anyone who was involved in the activities supported by the project. "Training" activities are those in which individuals with advanced professional skills and experience assist others in attaining greater proficiency. Training activities may include, for example, courses or one-on-one work with a mentor. "Professional development" activities result in increased knowledge or skill in one's area of expertise and may include workshops, conferences, seminars, study groups, and individual study. Include participation in conferences, workshops, and seminars not listed under major activities.

Nothing to report, other than the TC Research Core has been trained in all psychophysiology and cognitive assessments for this project.

How were the results disseminated to communities of interest?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how the results were disseminated to communities of interest. Include any outreach activities that were undertaken to reach members of communities who are not usually aware of these project activities, for the purpose of enhancing public understanding and increasing interest in learning and careers in science, technology, and the humanities.

There is nothing to report regarding the results. However the PI is beginning to speak regarding his preliminary data and about the upcoming/ongoing clinical trial to make the scientific community aware, as describe below.

What do you plan to do during the next reporting period to accomplish the goals?
If this is the final report, state "Nothing to Report."

Describe briefly what you plan to do during the next reporting period to accomplish the goals and objectives.

Recruitment and enrollment have been initiated to accomplish the currently unmet goals and objectives. Additionally, the PI has a presentation to the Autism Research Institute on August 2, 2017 regarding the preliminary data and the ongoing trial.

4. **IMPACT:** Describe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:

What was the impact on the development of the principal discipline(s) of the project?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how findings, results, techniques that were developed or extended, or other products from the project made an impact or are likely to make an impact on the base of knowledge, theory, and research in the principal disciplinary field(s) of the project. Summarize using language that an intelligent lay audience can understand (Scientific American style).

Nothing to Report

What was the impact on other disciplines?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how the findings, results, or techniques that were developed or improved, or other products from the project made an impact or are likely to make an impact on other disciplines.

Nothing to Report

What was the impact on technology transfer?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe ways in which the project made an impact, or is likely to make an impact, on commercial technology or public use, including:

- *transfer of results to entities in government or industry;*

- *instances where the research has led to the initiation of a start-up company; or*
- *adoption of new practices.*

Nothing to Report

What was the impact on society beyond science and technology?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how results from the project made an impact, or are likely to make an impact, beyond the bounds of science, engineering, and the academic world on areas such as:

- *improving public knowledge, attitudes, skills, and abilities;*
- *changing behavior, practices, decision making, policies (including regulatory policies), or social actions; or*
- *improving social, economic, civic, or environmental conditions.*

Nothing to Report

5. **CHANGES/PROBLEMS:** The Project Director/Principal Investigator (PD/PI) is reminded that the recipient organization is required to obtain prior written approval from the awarding agency Grants Officer whenever there are significant changes in the project or its direction. If not previously reported in writing, provide the following additional information or state, "Nothing to Report," if applicable:

Changes in approach and reasons for change
Describe any changes in approach during the reporting period and reasons for these changes. Remember that significant changes in objectives and scope require prior approval of the agency.

Subsequent to the amendments requested by the DOD, which are now completed and approved, we made one additional change, adding DNA collection with a buccal swab to allow future research into individualized medicine to be facilitated with our data as new salient markers are identified.

The only problem we had experienced was that we were not been able to initiate recruitment pending final approval from the *USAMRMC HRPO. This is now resolved*

Actual or anticipated problems or delays and actions or plans to resolve them
Describe problems or delays encountered during the reporting period and actions or plans to resolve them.

Recruitment is an expected challenge, and we will schedule regular meetings with our experienced Research Core at the Thompson Center to monitor the protocol for recruitment and will adjust accordingly with our ability to keep up with our planned enrollment schedule. This will receive additional attention as we were not able to initiate recruitment for several months. However, the rich clinical resources at the Thompson Center have met previous research needs very well, so we anticipate that this will not be a problem. However, we will monitor for the need to reach out for broader recruitment.

Changes that had a significant impact on expenditures

Describe changes during the reporting period that may have had a significant impact on expenditures, for example, delays in hiring staff or favorable developments that enable meeting objectives at less cost than anticipated.

Our study is financially on track for year 1. We are still under budget compared to what was budgeted with the proposal. We still expect to spend these additional funds in months to come with our accelerating recruitment in order to keep this project on track financially and to meet our goals of the project. No equipment or other department expenses were purchased.

Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents

Describe significant deviations, unexpected outcomes, or changes in approved protocols for the use or care of human subjects, vertebrate animals, biohazards, and/or select agents during the reporting period. If required, were these changes approved by the applicable institution committee (or equivalent) and reported to the agency? Also specify the applicable Institutional Review Board/Institutional Animal Care and Use Committee approval dates.

No significant changes since last quarterly report.

Target approved for clinical significance: **University of Missouri IRB (and HRPO pending) has approved the recruitment of 80 subjects for the Trial as of August 25, 2016**

Submitted to and Approved by:

Provide bullet point list of protocol development, submission, amendments, and approvals (include IRB in addition to HRPO).

- IRB approved, with Investigational Drug Service approval 25-Aug-2016
- Brain Imaging Center approval for imaging component, and fMRI stimuli prepared. 13-Sep-2016
- Registered on ClinicalTrials.gov, ClinicalTrials.gov identifier: NCT02871349, latest revision 03-Oct-2016
- Submitted for USAMRMC HPRO approval 29-Aug-2016, comments returned 1-Dec-2016, we responded 5-Jan-2017, further documents requested 14-Feb-2017, and we also added an amendment for genetic testing, approved by the IRB and forwarded 16-Mar-2017, with the other requested documents sent 22-Mar-2017, after clarification requested for the change in our trial monitor 27-Mar-2017, we sent new monitor's information 31-Mar-2017, approved 10-Apr-2017

Status:

Provide bullet point list of performance and/or progress status relating to the above protocol and discuss recruitment number, enrollment number, drop outs, disqualified, etc. Discuss any administrative, technical, or logistical issues that may impact performance or progress of the study (e.g. slow enrollment, large dropouts, or adverse events) for the above HPRO approved protocol.

- As above, IRB is approved, Brain Imaging Center protocol is approved, ClinicalTrials.gov registration is complete, and stimuli are prepared. We just received final approval from the USAMRMC HPRO to initiate recruitment and enrollment.

Significant changes in use or care of vertebrate animals.

Not Applicable

Significant changes in use of biohazards and/or select agents

Not Applicable

6. PRODUCTS: List any products resulting from the project during the reporting period. If there is nothing to report under a particular item, state "Nothing to Report."

- **Publications, conference papers, and presentations**
  Report only the major publication(s) resulting from the work under this award.

  Journal publications. *List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Identify for each publication: Author(s); title; journal; volume: year; page numbers; status of publication (published; accepted,*

awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

Nothing to Report

Books or other non-periodical, one-time publications. *Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like. Identify for each one-time publication: Author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (e.g., book, thesis or dissertation); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Nothing to Report

Other publications, conference papers, and presentations. *Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication as noted above. List presentations made during the last year (international, national, local societies, military meetings, etc.). Use an asterisk (*) if presentation produced a manuscript.*

Nothing to Report. However, as described above, the PI will be speaking to the Autism Research Institute on August 2, 2017 regarding the preliminary data and the ongoing trial.

- **Website(s) or other Internet site(s)**
  List the URL for any Internet site(s) that disseminates the results of the research activities. A short description of each site should be provided. It is not necessary to include the publications already specified above in this section.

This research is described on the Lab Website of Dr. Beversdorf http://medicine2.missouri.edu/beversdorflab/projects.html This research is also described on the Website of the Thompson Center https://thompsoncenter.missouri.edu/autism-research/join-a-study/ It is also listed on ClinicalTrials.gov https://clinicaltrials.gov/ct2/show/NCT02871349

- **Technologies or techniques**
  Identify technologies or techniques that resulted from the research activities. In addition to a description of the technologies or techniques, describe how they will be shared.

Nothing to Report

- **Inventions, patent applications, and/or licenses**
  Identify inventions, patent applications with date, and/or licenses that have resulted from the research. State whether an application is provisional or non-provisional and indicate the application number. Submission of this information as part of an interim research performance progress report is not a substitute for any other invention reporting required under the terms and conditions of an award.

Nothing to Report

- **Other Products**
  Identify any other reportable outcomes that were developed under this project. Reportable outcomes are defined as a research result that is or relates to a product, scientific advance, or research tool that makes a meaningful contribution toward the understanding, prevention, diagnosis, prognosis, treatment, and/or rehabilitation of a disease, injury or condition, or to improve the quality of life. Examples include:
  - *data or databases;*
  - *biospecimen collections;*
  - *audio or video products;*
  - *software;*
  - *models;*
  - *educational aids or curricula;*
  - *instruments or equipment;*
  - *research material (e.g., Germplasm; cell lines, DNA probes, animal models);*
  - *clinical interventions;*
  - *new business creation; and*
  - *other.*

Nothing to Report

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?
Provide the following information for: (1) PDs/PIs; and (2) each person who has worked at least one person month per year on the project during the reporting period, regardless of the source of compensation (a person month equals approximately 160 hours of effort). If information is unchanged from a previous submission, provide the name only and indicate "no change."

Name:	*David Beversdorf, MD*
Project Role:	*Principal Investigator*
Researcher Identifier (e.g. ORCID ID):	0000-0002-0298-0634
Nearest person month worked:	*3*
Contribution to Project:	*Dr. Beversdorf has overseen the initiation of the entire project.*
Funding Support:	*In addition to the DOD, Dr. Beversdorf is also funded by the William and Nancy Thompson Endowed Chair in Radiology, Psychological Sciences, Medical Research Office, Neurology, Radiology, The Thompson Center and Dr. Cheak-Zamora's DOD grant.*
Name:	*Bradley Ferguson, PhD*
Project Role:	*Graduate Student/Postdoc*
Researcher Identifier (e.g. ORCID ID):	0000-0002-1636-7849
Nearest person month worked:	*3*
Contribution to Project:	*Dr. Ferguson has overseen all of the psychophysiology assessment preparation and training, in addition to the training for cognitive assessments, and helped Briana with the approvals.*
Funding Support:	*In addition to the DOD, Dr. Ferguson was supported by The Center For Discovery.*
Name:	*Neetu Nair*
Project Role:	*Graduate Student*
Researcher Identifier (e.g. ORCID ID):	0000-0003-3301-2676
Nearest person month worked:	*1*
Contribution to Project:	*Neetu has led the preparation of all of the imaging aspects for this project.*
Funding Support:	*Research Board Grant.*
Name:	*Briana Kille*
Project Role:	*Graduate Student*
Researcher Identifier (e.g. ORCID ID):	*(no ORCID account)*
Nearest person month worked:	*3*
Contribution to Project:	*Briana has overseen all aspects of approval for the current work, and has overall served as a coordinator.*
Funding Support:	*In addition to the DOD, Briana has been supported the Department of Psychological Sciences where she had previously served as a teaching assistant.*

Personnel	Role	Percent Effort
Beversdorf, David	PI	15.60%
Christ, Shawn	Co-I	5%
Dyke, Peter	Co-I	2%
Johnson, Jeff	Co-I	5%
Kanne, Stephen	Co-I	5%
Mazurek, Micah	Co-I	5%
Petroski, Greg	Co-I	10%
Sohl, Kristin	Co-I	5%
Stichter, Janine	Co-I	5%
Yao, Gang	Co-I	5%
Ferguson, Bradley	Postdoctoral Research Asst	50%
Kille, Brianna	Graduate Research Asst	50%
Lolli, Bridgette	Nurse Clinician	10%
Mahurin, Melissa	Research Coordinator	20%
Takahashi, Nicole	Project Manager	10%

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

If the active support has changed for the PD/PI(s) or senior/key personnel, then describe what the change has been. Changes may occur, for example, if a previously active grant has closed and/or if a previously pending grant is now active. Annotate this information so it is clear what has changed from the previous submission. Submission of other support information is not necessary for pending changes or for changes in the level of effort for active support reported previously. The awarding agency may require prior written approval if a change in active other support significantly impacts the effort on the project that is the subject of the project report.

Nothing to Report

What other organizations were involved as partners?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe partner organizations – academic institutions, other nonprofits, industrial or commercial firms, state or local governments, schools or school systems, or other organizations (foreign or domestic) – that were involved with the project. Partner organizations may have provided financial or in-kind support, supplied facilities or equipment, collaborated in the research, exchanged personnel, or otherwise contributed.
Provide the following information for each partnership:

Organization Name:
Location of Organization: (if foreign location list country)
Partner's contribution to the project (identify one or more)

- *Financial support;*
- *In-kind support (e.g., partner makes software, computers, equipment, etc., available to project staff);*
- *Facilities (e.g., project staff use the partner's facilities for project activities);*
- *Collaboration (e.g., partner's staff work with project staff on the project);*
- *Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); and*
- *Other.*

Nothing to Report

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: For collaborative awards, independent reports are required from BOTH the Initiating PI and the Collaborating/Partnering PI. A duplicative report is acceptable; however, tasks shall be clearly marked with the responsible PI and research site. A report shall be submitted to **https://ers.amedd.army.mil** for each unique award.

QUAD CHARTS: If applicable, the Quad Chart (available on https://www.usamraa.army.mil) should be updated and submitted with attachments.

9. APPENDICES: Attach all appendices that contain information that supplements, clarifies or supports the text. Examples include original copies of journal articles, reprints of manuscripts and abstracts, a curriculum vitae, patent applications, study questionnaires, and surveys, etc.

There are no new materials relevant to this work. All surveys and questionnaires were already part of the original materials.